

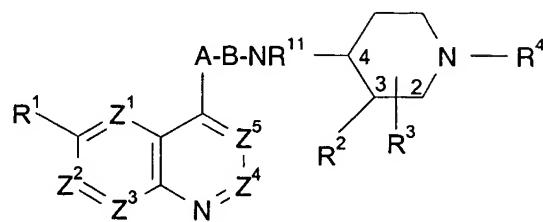
Amendments to the claims:

This listing of claims will replace all prior versions, and listing, of claims in the application:

Listing of Claims:

What is claimed is:

1. **(Currently Amended).** A compound of formula (I) or a pharmaceutically acceptable derivative thereof:



(I)

wherein:

one of Z^1 , Z^2 , Z^3 , Z^4 and Z^5 is N, one is CR^{1a} , and the remainder are CH, or one of Z^1 , Z^2 , Z^3 , Z^4 and Z^5 is CR^{1a} , and the remainder are CH;

R^1 and R^{1a} are independently hydrogen; hydroxy; (C_{1-6}) alkoxy optionally substituted by (C_{1-6}) alkoxy, amino, piperidyl, guanidino or amidino optionally N-substituted by one or two (C_{1-6}) alkyl, acyl or (C_{1-6}) alkylsulphonyl groups, $CONH_2$, hydroxy, thiol, (C_{1-6}) alkylthio, heterocyclithio, heterocyclxy, arylthio, aryloxy, acyloxy or (C_{1-6}) alkylsulphonyloxy; (C_{1-6}) alkoxy-substituted (C_{1-6}) alkyl; halogen; (C_{1-6}) alkyl; (C_{1-6}) alkylthio; nitro; azido; acyl; acyloxy; acylthio; (C_{1-6}) alkylsulphonyl; (C_{1-6}) alkylsulphoxide; arylsulphonyl; arylsulphoxide or an amino, piperidyl, guanidino or amidino group optionally N-substituted by one or two (C_{1-6}) alkyl, acyl or (C_{1-6}) alkylsulphonyl groups; **and**

~~additionally when Z^5 is CR^{1a} , R^{1a} may be (C_{1-4}) alkyl- CO_2H or (C_{1-4}) alkyl- $CONH_2$ in which the C_{1-4} alkyl is substituted by R^{12} ; (C_{1-4}) alkyl substituted by amino, cyano or guanidino; aminocarbonyl optionally substituted by hydroxy, (C_{1-6}) alkyl, hydroxy (C_{1-6}) alkyl, aminocarbonyl (C_{1-6}) alkyl, (C_{2-6}) alkenyl, (C_{1-6}) alkylsulphonyl, trifluoromethylsulphonyl, (C_{2-6}) alkenylsulphonyl, (C_{1-6})~~

~~6)alkoxycarbonyl, (C₁₋₆)alkylcarbonyl, (C₂₋₆)alkenyloxycarbonyl, (C₂₋₆)alkenylcarbonyl, or CH(R¹³)CO₂H or CH(R¹³)CONH₂ optionally further substituted by (C₁₋₆)alkyl, hydroxy(C₁₋₆)alkyl, aminocarbonyl(C₁₋₆)alkyl or (C₂₋₆)alkenyl; hydroxy(C₁₋₆)alkyl; carboxy; cyano or (C₁₋₆)alkoxycarbonyl; wherein R¹³ is a natural amino acid side chain, or its enantiomer;~~

provided that when one of Z¹, Z², Z³, Z⁴ and Z⁵ is CR^{1a} and the remainder are CH, then R¹ is not hydrogen;

R² is hydrogen;

R³ is hydrogen; or

R³ is in the 2-, 3- or 4-position and is:

carboxy; (C₁₋₆)alkoxycarbonyl; aminocarbonyl wherein the amino group is optionally substituted by hydroxy, (C₁₋₆)alkyl, hydroxy(C₁₋₆)alkyl, aminocarbonyl(C₁₋₆)alkyl, (C₂₋₆)alkenyl, (C₁₋₆)alkylsulphonyl, trifluoromethylsulphonyl, (C₂₋₆)alkenylsulphonyl, (C₁₋₆)alkoxycarbonyl, (C₁₋₆)alkylcarbonyl, (C₂₋₆)alkenyloxycarbonyl or (C₂₋₆)alkenylcarbonyl and optionally further substituted by (C₁₋₆)alkyl, hydroxy(C₁₋₆)alkyl, aminocarbonyl(C₁₋₆)alkyl or (C₂₋₆)alkenyl; cyano; tetrazolyl; 2-oxo-oxazolidinyl optionally substituted by R¹⁰; 3-hydroxy-3-cyclobutene-1,2-dione-4-yl; 2,4-thiazolidinedione-5-yl; tetrazol-5-ylaminocarbonyl; 1,2,4-triazol-5-yl optionally substituted by R¹⁰; or 5-oxo-1,2,4-oxadiazol-3-yl; or (C₁₋₄)alkyl or ethenyl optionally substituted with any of the substituents listed above for R³ and/or up to 3 groups R¹² independently selected from:

thiol; halogen; (C₁₋₆)alkylthio; trifluoromethyl; azido; (C₁₋₆)alkoxycarbonyl; (C₁₋₆)alkylcarbonyl; (C₂₋₆)alkenyloxycarbonyl; (C₂₋₆)alkenylcarbonyl; hydroxy optionally substituted by (C₁₋₆)alkyl, (C₂₋₆)alkenyl, (C₁₋₆)alkoxycarbonyl, (C₁₋₆)alkylcarbonyl, (C₂₋₆)alkenyloxycarbonyl, (C₂₋₆)alkenylcarbonyl or aminocarbonyl wherein the amino group is optionally substituted by (C₁₋₆)alkyl, (C₂₋₆)alkenyl, (C₁₋₆)alkylcarbonyl or (C₂₋₆)alkenylcarbonyl; amino optionally mono- or disubstituted by (C₁₋₆)alkoxycarbonyl, (C₁₋₆)alkylcarbonyl, (C₂₋₆)alkenyloxycarbonyl, (C₂₋₆)alkenylcarbonyl, (C₁₋₆)alkyl, (C₂₋₆)alkenyl, (C₁₋₆)alkylsulphonyl, (C₂₋₆)alkenylsulphonyl or aminocarbonyl wherein the amino group is optionally substituted by (C₁₋₆)alkyl or (C₂₋₆)alkenyl; aminocarbonyl wherein the amino group is optionally substituted by (C₁₋₆)alkyl, hydroxy(C₁₋₆)alkyl, aminocarbonyl(C₁₋₆)alkyl, (C₂₋₆)alkenyl, (C₁₋₆)alkylcarbonyl, (C₂₋₆)alkenylcarbonyl, (C₁₋₆)alkyl, (C₂₋₆)alkenyl, (C₁₋₆)alkylsulphonyl, (C₂₋₆)alkenylsulphonyl or aminocarbonyl wherein the amino group is optionally substituted by (C₁₋₆)alkyl or (C₂₋₆)alkenyl; aminocarbonyl

(C₂-6)alkenyloxycarbonyl or (C₂-6)alkenylcarbonyl and optionally further substituted by (C₁-6)alkyl, hydroxy(C₁-6)alkyl, aminocarbonyl(C₁-6)alkyl or (C₂-6)alkenyl; oxo; (C₁-6)alkylsulphonyl; (C₂-6)alkenylsulphonyl; or (C₁-6)aminosulphonyl wherein the amino group is optionally substituted by (C₁-6)alkyl or (C₂-6)alkenyl; in addition when R³ is disubstituted with a hydroxy or amino containing substituent and a carboxy containing substituent these may together form a cyclic ester or amide linkage, respectively; or

when R³ is in the 3-position R² and R³ may together form a divalent residue =CR⁵¹R⁶¹ where R⁵¹ and R⁶¹ are independently selected from hydrogen, (C₁-6)alkyl, (C₂-6)alkenyl, aryl(C₁-6)alkyl and aryl(C₂-6)alkenyl, any alkyl or alkenyl moiety being optionally substituted by up to three R¹² groups;

R⁴ is (C₅-12)alkyl, optionally substituted phenyl(C₂-3)alkyl or optionally substituted phenyl(C₃-4)alkenyl;

R⁴ is a group -CH₂-R⁵ in which R⁵ is selected from:

~~(C₁-12)alkyl; hydroxy(C₁-12)alkyl; (C₁-12)alkoxy(C₁-12)alkyl; (C₁-12)alkanoyloxy(C₁-12)alkyl; (C₃-6)cycloalkyl; hydroxy(C₃-6)cycloalkyl; (C₁-12)alkoxy(C₃-6)cycloalkyl; (C₁-12)alkanoyloxy(C₃-6)cycloalkyl; (C₃-6)cycloalkyl(C₁-12)alkyl; hydroxy-, (C₁-12)alkoxy- or (C₁-12)alkanoyloxy-(C₃-6)cycloalkyl(C₁-12)alkyl; cyano; cyano(C₁-12)alkyl; (C₂-12)alkenyl; (C₂-12)alkynyl; tetrahydrefuryl; mono- or di-(C₁-12)alkylamino(C₁-12)alkyl; acylamino(C₁-12)alkyl; (C₁-12)alkyl- or acyl-aminecarbonyl(C₁-12)alkyl; mono- or di-(C₁-12)alkylamino(hydroxy)-(C₁-12)alkyl; optionally substituted phenyl(C₁-12)alkyl, phenoxy(C₁-12)alkyl or phenyl(hydroxy)(C₁-12)alkyl; optionally substituted diphenyl(C₁-12)alkyl; optionally substituted phenyl(C₂-12)alkenyl; optionally substituted benzoyl or benzoyl(C₁-12)alkyl; optionally substituted heteroaryl or heteroaryl(C₁-12)alkyl; and optionally substituted heteroareoyl or heteroareoyl(C₁-12)alkyl;~~

A is CR⁶R⁷ and B is SO₂, CO or CH₂ wherein:

each of R⁶ and R⁷ is independently selected from: hydrogen; (C₁-6)alkoxy; thiol; (C₁-6)alkylthio; halo; trifluoromethyl; azido; (C₁-6)alkyl; (C₂-6)alkenyl; (C₁-6)alkoxycarbonyl; (C₁-6)alkylcarbonyl; (C₂-6)alkenyloxycarbonyl; (C₂-6)alkenylcarbonyl; hydroxy, amino

or aminocarbonyl optionally substituted as for corresponding substituents in R^3 ; (C₁₋₆)alkylsulphonyl; (C₂₋₆)alkenylsulphonyl; or (C₁₋₆)aminosulphonyl wherein the amino group is optionally substituted by (C₁₋₆)alkyl or (C₂₋₆)alkenyl;

R^{10} is selected from (C₁₋₄)alkyl; (C₂₋₄)alkenyl and aryl any of which may be optionally substituted by a group R^{12} as defined above; carboxy; aminocarbonyl wherein the amino group is optionally substituted by hydroxy, (C₁₋₆)alkyl, (C₂₋₆)alkenyl, (C₁₋₆)alkylsulphonyl, trifluoromethylsulphonyl, (C₂₋₆)alkenylsulphonyl, (C₁₋₆)alkoxycarbonyl, (C₁₋₆)alkylcarbonyl, (C₂₋₆)alkenyloxycarbonyl or (C₂₋₆)alkenylcarbonyl and optionally further substituted by (C₁₋₆)alkyl or (C₂₋₆)alkenyl; (C₁₋₆)alkylsulphonyl; trifluoromethylsulphonyl; (C₂₋₆)alkenylsulphonyl; (C₁₋₆)alkoxycarbonyl; (C₁₋₆)alkylcarbonyl; (C₂₋₆)alkenyloxycarbonyl; and (C₂₋₆)alkenylcarbonyl;

and R^{11} is hydrogen; or (C₁₋₄)alkyl or (C₂₋₄)alkenyl optionally substituted with 1 to 3 groups selected from:

carboxy; (C₁₋₄)alkoxycarbonyl; (C₁₋₄)alkylcarbonyl; (C₂₋₄)alkenyloxycarbonyl; (C₂₋₄)alkenylcarbonyl; aminocarbonyl wherein the amino group is optionally substituted by hydroxy, (C₁₋₄)alkyl, hydroxy(C₁₋₄)alkyl, aminocarbonyl(C₁₋₄)alkyl, (C₂₋₄)alkenyl, (C₁₋₄)alkylsulphonyl, trifluoromethylsulphonyl, (C₂₋₄)alkenylsulphonyl, (C₁₋₄)alkoxycarbonyl, (C₁₋₄)alkylcarbonyl, (C₂₋₄)alkenyloxycarbonyl or (C₂₋₄)alkenylcarbonyl; cyano; tetrazolyl; 2-oxo-oxazolidinyl optionally substituted by R^{10} ; 3-hydroxy-3-cyclobutene-1,2-dione-4-yl; 2,4-thiazolidinedione-5-yl; tetrazol-5-ylaminocarbonyl; 1,2,4-triazol-5-yl optionally substituted by R^{10} ; 5-oxo-1,2,4-oxadiazol-3-yl; thiol; halogen; (C₁₋₄)alkylthio; trifluoromethyl; azido; hydroxy optionally substituted by (C₁₋₄)alkyl, (C₂₋₄)alkenyl, (C₁₋₄)alkoxycarbonyl, (C₁₋₄)alkylcarbonyl, (C₂₋₄)alkenyloxycarbonyl, (C₂₋₄)alkenylcarbonyl; oxo; (C₁₋₄)alkylsulphonyl; (C₂₋₄)alkenylsulphonyl; or (C₁₋₄)aminosulphonyl wherein the amino group is optionally substituted by (C₁₋₄)alkyl or (C₂₋₄)alkenyl.

2. **(Currently Amended)** A compound according to claim 1 wherein:

- (a) Z^1 is N, Z^3 is CH or CF, and Z^2 , Z^4 , and Z^5 are CH,
- (b) ~~Z^1-Z^5 are each CH, Z^3 is CH or CF and Z^1 , Z^2 , Z^4 , and Z^5 are CH~~, or
- (c) Z^5 is N, Z^3 is CH or CF, and Z^1 , Z^2 , and Z^4 are CH, and Z^3 may instead be CF.

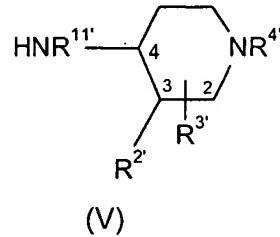
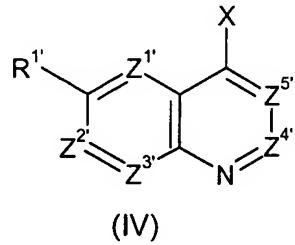
3. **(Previously Presented).** A compound according to claim 1 wherein R¹ and R^{1a} are independently methoxy, amino(C₃₋₅)alkyloxy, guanidino(C₃₋₅)alkyloxy, piperidyl(C₃₋₅)alkyloxy, nitro or fluoro.
4. **(Previously Presented).** A compound according to claim 1 wherein R³ is hydrogen; (C₁₋₄)alkyl; ethenyl; optionally substituted 1-hydroxy(C₁₋₄)alkyl; carboxy; (C₁₋₆)alkoxycarbonyl; optionally substituted aminocarbonyl; carboxy(C₁₋₄)alkyl; optionally substituted aminocarbonyl(C₁₋₄)alkyl; cyano(C₁₋₄)alkyl; optionally substituted 2-oxo-oxazolidinyl or optionally substituted 2-oxo-oxazolidinyl(C₁₋₄alkyl).
5. **(Previously Presented).** A compound according to claim 1 wherein R³ is in the 3-position and the substitutents at the 3- and 4-position of the piperidine ring are *cis*.
6. **(Previously Presented).** A compound according to claim 1 wherein A is CHOH or CH₂, and B is CH₂.
7. **(Previously Presented).** A compound according to claim 1 wherein R¹¹ is hydrogen.
8. **(Cancelled).**
9. **(Original).** A compound according to claim 1 selected from:
1-Heptyl-4-[2-(R)-hydroxy-2-(6-methoxyquinolin-4-yl)]ethylaminopiperidine;
cis-3-(R/S)-Ethoxycarbonyl-1-heptyl-4-(S/R)-[2-(R)-hydroxy-2-(6-methoxyquinolin-4-yl)]ethylaminopiperidine;
cis-3-(R/S)-Aminocarbonyl-1-heptyl-4-(S/R)-[2-(R)-hydroxy-2-(6-methoxyquinolin-4-yl)]ethylaminopiperidine;
cis-1-Heptyl-3-(R/S)-hydroxymethyl-4-(S/R)-[2-(R)-hydroxy-2-(6-methoxyquinolin-4-yl)]ethylaminopiperidine;
cis-3-(R/S)-carboxy-1-heptyl-4-(S/R)-[2-(R)-hydroxy-2-(6-methoxyquinolin-4-yl)]ethylaminopiperidine;
1-Heptyl-4-[2-(S)-hydroxy-2-(6-methoxyquinolin-4-yl)]ethylaminopiperidine; or
1-Heptyl-4-[2-(R)-hydroxy-2-(6-methoxyquinolin-4-yl)]ethyl(N-methyl)aminopiperidine;
or a pharmaceutically acceptable derivative thereof.

10. **(Original).** A pharmaceutical composition comprising a compound of formula (I) as defined in claim 1, or a pharmaceutically acceptable derivative thereof, and a pharmaceutically acceptable carrier.

11. **(Original).** A method of treatment of bacterial infections in mammals which method comprises the administration to a mammal in need of such treatment an effective amount of a compound of formula (I) as defined in claim 1, or a pharmaceutically acceptable derivative thereof.

12. **(Cancelled).**

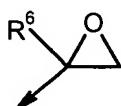
13. **(Original).** A process for preparing a compound of formula (I) as defined in claim 1, or a pharmaceutically acceptable derivative thereof, which process comprises: reacting a compound of formula (IV) with a compound of formula (V):



wherein $Z^{1'}$, $Z^{2'}$, $Z^{3'}$, $Z^{4'}$, $Z^{5'}$, $R^{11'}$, $R^{1'}$, $R^{2'}$, $R^{3'}$ and $R^{4'}$ are Z^1 , Z^2 , Z^3 , Z^4 , Z^5 , R^{11} , R^1 , R^2 , R^3 and R^4 as defined in formula (I) or groups convertible thereto; and:

- (i) X is $CR^6R^7SO_2W$
- (ii) X is $A'-COW$
- (iii) X is $CR^6=CH_2$
- (iv) X is oxirane and

in which W is a leaving group e.g. halogen, A' is A as defined in formula (I), or a group convertible thereto, and oxirane is:



wherein R⁶ and R⁷ are as defined in formula (I);
and thereafter optionally or as necessary converting Z^{1'}, Z^{2'}, Z^{3'}, Z^{4'}, Z^{5'}, A', R^{11'}, R^{1'},
R^{2'}, R^{3'} and R^{4'} to Z¹, Z², Z³, Z⁴, Z⁵, A, R¹¹, R¹, R², R³ and R⁴, converting A-B to
other A-B, interconverting R¹¹, R¹, R², R³ and/or R⁴, and/or forming a
pharmaceutically acceptable derivative thereof.